

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 July 2004 (08.07.2004)

PCT

(10) International Publication Number
WO 2004/057721 A1

- (51) International Patent Classification⁷: **H02J 3/38**
- (21) International Application Number:
PCT/IB2003/005483
- (22) International Filing Date:
24 November 2003 (24.11.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
02080406.8 19 December 2002 (19.12.2002) EP
- (71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL];
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **DOEDEE, Antonius, H., F., E.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656

AA Eindhoven (NL). **HENDRIX, Machiel, A., M.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **PUTMANS, Janmarinus, C., A.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

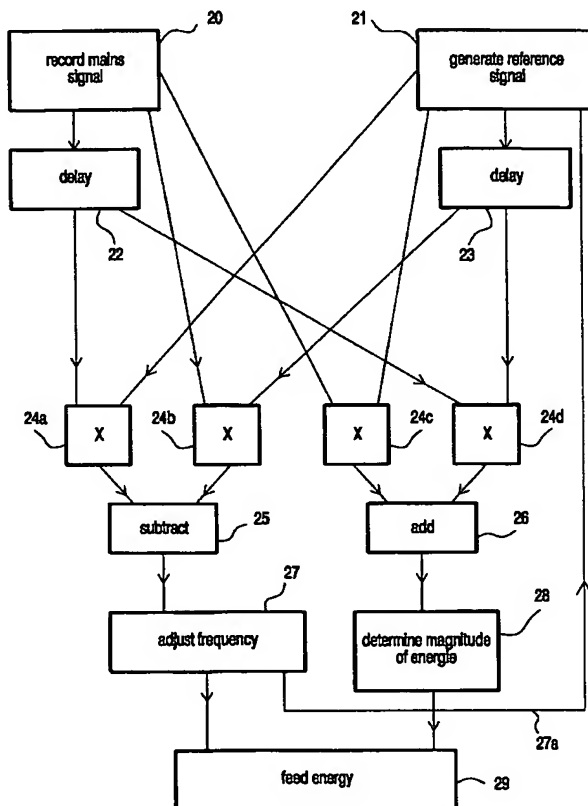
(74) Agent: **BOSMA, Rudolphus, H., A.**; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR FEEDING ELECTRICAL ENERGY INTO AN ALTERNATING CURRENT ELECTRICAL MAINS



(57) Abstract: In a method and system for feeding electrical energy into an alternating current electrical mains the mains signal is recorded and a reference signal generated. From the mains signal and the reference signal a delayed mains signal and a delayed reference signal is derived. Then, the mains signal is multiplied by the delayed reference signal and the delayed mains signal is multiplied with the reference signal. By determining a difference between the multiplied signals, a phase difference between the fundamental harmonic frequency of the mains signal and the reference signal can be derived. Making use of the phase difference, the frequency of the reference signal can be adjusted. From the reference signal a synchronization signal for synchronizing a converter is derived, the synchronization signal synchronizing an electrical output alternating current energy of the converter. Thus, energy is fed into the mains by the converter in synchronism with the fundamental harmonic frequency of the mains signal.



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*